

1 1. A method comprising:
2 attaching ligands along the length of a polymer
3 to form a brush for cleaning semiconductor wafers.

1 2. The method of claim 1 including attaching ligands
2 using a hydrolysis reaction.

1 3. The method of claim 1 including attaching ligands
2 along the length of a polyvinyl alcohol polymer.

1 4. The method of claim 1 including using a coupling
2 agent to attach ligands along the length of a polymer
3 chain.

1 5. The method of claim 1 including attaching ligands
2 to provide a hydrophilic property.

1 6. The method of claim 1 including attaching ligands
2 to provide hydrophobic property.

1 7. The method of claim 1 including attaching ligands
2 to provide a reducing agent property.

1 8. The method of claim 1 including attaching ligands
2 to provide an oxidizing property.

1 9. The method of claim 1 including attaching ligands
2 to provide an attraction to a specific material.

1 10. The method of claim 1 including attaching ligands
2 to change the zeta potential.

1 11. The method of claim 1 including attaching a
2 ligand having a subchain to the polymer.

1 12. The method of claim 11 including attaching a
2 moiety to said subchain to provide a desired property to
3 said ligand.

1 13. A method comprising:
2 cleaning a semiconductor wafer using a polymer
3 brush having ligands attached along the length of a
4 polymer.

1 14. The method of claim 13 including using a brush
2 having ligands attached to polyvinyl alcohol polymer
3 bristles.

1 15. The method of claim 13 including using a brush
2 having ligands that to provide a hydrophilic property.

1 16. The method of claim 13 including using a brush
2 having ligands that provide a hydrophobic property.

1 17. The method of claim 13 including using a brush
2 having ligands that provide a reducing agent property.

1 18. The method of claim 13 including using a brush
2 having ligands that provide an oxidizing property.

1 19. The method of claim 13 including using a brush
2 having ligands that are attracted to a specific material.

1 20. The method of claim 13 including using a brush
2 having ligands having a positive zeta potential.

1 21. The method of claim 13 including using a brush
2 having ligands having a negative zeta potential.

1 22. The method of claim 13 including using a brush
2 having a ligand having a subchain of at least two carbon
3 atoms.

1 23. The method of claim 22 including using a brush
2 having a moiety on said subchain to provide a desired
3 property to said ligand.

1 24. A brush for cleaning semiconductor wafers
2 comprising:

3 a polymer chain having ligands attached along the
4 length of the chain.

1 25. The brush of claim 24 wherein said chain is a
2 polyvinyl alcohol polymer chain.

1 26. The brush of claim 25 wherein said chain is a
2 formal polyvinyl alcohol chain.

1 27. The brush of claim 24 wherein one of said ligands
2 includes a hydrophilic moiety.

1 28. The brush of claim 24 wherein one of said ligands
2 includes a hydrophobic moiety.

1 29. The brush of claim 24 wherein one of said ligands
2 includes a reducing agent moiety.

1 30. The brush of claim 24 wherein one of said ligands
2 includes an oxidizer.

1 31. The brush of claim 24 wherein one of said ligands
2 includes a moiety attracted to a specific material.

1 32. The brush of claim 24 wherein one of said ligands
2 includes a negative zeta potential moiety.

1 33. The brush of claim 24 wherein one of said ligands
2 includes a positive zeta potential moiety.

1 34. The brush of claim 24 wherein one of said ligands
2 is attached to a carbon chain having at least two carbon
3 atoms.